

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF DELAWARE

IN THE MATTER OF THE APPLICATION
OF ARTESIAN WATER COMPANY, INC.
FOR AUTHORITY TO INCREASE RATES
AND CHARGES FOR WATER SERVICE
(Filed April 11, 2014)

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PSC Docket No. 14-_____

**DIRECT TESTIMONY
OF
JOHN F.GUASTELLA
ON BEHALF OF
ARTESIAN WATER COMPANY, INC.**

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April 11, 2014

1 **Q. Please state your name and business address.**

2 A. John F. Guastella, Guastella Associates, LLC, 6 Beacon Street, Suite 200, Boston, MA
3 02108.
4

5 **Q. Please describe Guastella Associates, LLC.**

6 A. Guastella Associates, LLC provides utility management, valuation and rate consulting
7 services to both regulated and unregulated utilities.
8

9 **Q. Have you provided a statement of qualifications and experience of yourself and your
10 firm?**

11 A. Yes, it is provided as an appendix to this testimony.
12

13 **Q. What is the nature of your testimony?**

14 A. Our assignment in this case was to prepare a cost of service and rate design study
15 ("COSS"). The purpose of this testimony is to present the results of that study.
16

17 **Q. Have you previously prepared cost of service and rate design studies for Artesian
18 Water Company, Inc. ("AWC" or the "Company")?**

19 A. Yes.
20

21 **Q. Are the objectives of the cost of service and rate design study the same as in the
22 previous cases?**

1 A. Yes. The objectives of the COSS are to establish the cost of serving each class of
2 customer and to design a rate structure that reasonably recovers those costs, while also
3 promoting water conservation.
4

5 **Q. Is the currently proposed rate structure continuing to encourage conservation?**

6 A. Yes. The proposed rate structure maintains inclining block rates (meaning increasing
7 rates for higher levels of usage) for "Residential" and "All Other" customers. The
8 inclining block rates combined with separate rates for different customer classes enables
9 the Company to promote conservation with pricing while also achieving cost recovery
10 from the respective customer classes.
11

12 **Q. What other customer classes does the Company serve?**

13 A. The Company's tariff also includes separate rates for six Wholesale or Contract
14 customers, and for Christiana Care Hospital ("CCH"). Three of these customers have
15 contracts with specific rate provisions: the City of New Castle pays a rate on the basis of
16 the Company's lowest purchased water rate, the Town of Chesapeake pays a rate that is
17 20% higher than the rate the Company pays to the Chester Water Authority for bulk water
18 purchases, and Artesian Water of Maryland ("AWMD") pays a rate that is 10% higher
19 than the rate the Company pays to the Chester Water Authority for bulk water purchases.
20 The contract the Company has with the Town of Clayton is for water going to or from
21 Clayton, and the rate that the Company pays to Clayton is \$2.00 per thousand gallons, for
22 which no increase is being requested. The revenues from these contract customers have

1 been determined by applying the contract rates to their respective usage, and used to
2 offset the Company's pro forma revenue requirement. The rates for wholesale water
3 service to the Town of Middletown and the Delaware Correctional Center ("DCC") are
4 being determined in the COSS. While the DCC does not itself provide water or services
5 to Artesian's customers by agreement, it is a large use customer whose own water
6 production facilities have been assigned to and operated by Artesian under a separate
7 agreement.

8 The Company also provides public and private fire service. The cost of providing
9 public fire service is recouped through a charge to individual customers that receive
10 public fire protection service, according to each customer's meter size. The cost of
11 providing private fire service is recouped through a charge per size connection for
12 customers with sprinklers.

13
14 **Q. What is the cost basis for your study?**

15 A. My study is based on the pro forma revenue requirement in the amount of \$72,736,139
16 that the Company has used to support its rate increase, as reflected in Schedule DLV 3-2,
17 which is attached to Mr. Valcarengi's testimony.

18
19 **Q. Would you briefly describe your scope of work?**

20 A. Yes. All source data was obtained from the Company. We examined financial and
21 operating data, including detailed asset, revenue and expense schedules as well as
22 production data. We examined billing data in order to develop a billing analysis. We had

1 numerous telephone discussions with Company representatives in order to compile data
2 and confirm that no significant changes in the operation of the utility have occurred that
3 would significantly impact the study. We have relied on our previous physical inspection
4 of the system's major facilities.
5

6 **Q. Have you prepared an exhibit containing the results of your cost of service study?**

7 A. Yes. The cost of service study is set forth in JFG Exhibit 1.
8

9 **Q. Have you used the same methodology in this study as in the previous studies you**
10 **have prepared for the Company?**

11 A. Yes.
12

13 **Q. Although you have previously described this method, would you do so again for the**
14 **purposes of this record?**

15 A. The COSS is based on the Base-Extra Capacity method. This method, which is described
16 and illustrated in the American Water Works Association ("AWWA") Water Rates
17 Manual (M-1), identifies and classifies the various cost components which comprise the
18 revenue requirement, categorizes the costs according to what drives the quantity of costs
19 incurred according to the general design criteria and operation of a water utility, which we
20 refer to as "functionalizing" the cost components, and allocates the functionalized costs to
21 the customer classes. It also incorporates a fire service allocation within the format of the
22 study.

1
2 **Q. How did you classify and functionalize costs?**

3 A. Artesian's investment in utility plant in service was analyzed according to the primary
4 plant accounts of the prescribed Uniform System of Accounts, which classify different
5 components of the utility system. Those components are then functionalized according to
6 the design and use of the system in meeting the demands of the customers. The functions
7 used in the Base-Extra Capacity method are: Base, Extra Capacity Maximum Day, Extra
8 Capacity Peak Hour, Customer (split between "Meters/Services" and "Billing and
9 Accounting") and Hydrant costs.

10 Base costs are those that tend to vary according to average use.

11 Extra Capacity costs, encompassing both Maximum Day and Peak Hour costs, are
12 costs that tend to vary according to the maximum day or peak hour demands on the
13 system.

14 Customer costs for billing and accounting, which includes collections
15 (collectively referred to as commercial costs) do not vary according to either average or
16 maximum demands and instead vary according to the number of bills. Similarly,
17 customer costs for meters and services tend to vary according to the equivalent number of
18 such units.

19 Hydrant costs are those directly allocated to public fire service.

20 After costs have been classified and functionalized, they are allocated to the
21 various customer classes according to the relative average, maximum day and peak hour
22 demands of each class, and the relative bills and equivalent meters of each class.

1
2 **Q. Is the Base-Extra Capacity cost allocation method you described set forth in JFG**
3 **Exhibit 1?**

4 A. Yes.
5

6 **Q. Would you please describe Schedule 1?**

7 A. Schedule 1 summarizes the allocation of the revenue requirement by functional
8 classification to the customer classes. In other words, it quantifies the portion of the
9 revenue requirement that should be recovered through rates for service from each class of
10 customer. As reflected in Schedule 1, the customer classes are Residential, All Other,
11 CCH, Wholesale 1 (Middletown), Wholesale 2 (DCC), and Fire Service.

12
13 **Q. Is Schedule 1 used as the cost basis to develop the rate design?**

14 A. Yes. Schedule 1 shows the revenues to be generated by each class of customer through
15 rates. Subsequent schedules show the specific calculation of rates.
16

17 **Q. Would you please explain how you "functionalized" the costs that are reflected in**
18 **Schedule 1?**

19 A. Yes. The allocation of cost components to the functions of Base, Extra Capacity
20 Maximum Day, Extra Capacity Peak Hour, Customer and Hydrants, is accomplished as
21 shown on Schedules 2 through 10.
22

1 **Q. Before proceeding with an explanation of your schedules in numerical order, how**
2 **did you establish the total system demands used for the cost allocation?**

3 A. As a first step, analyses were made of the total system water demands. Based on these
4 analyses, system demand ratios of 1.70 and 2.50 were established for maximum day and
5 peak hour demands in relation to the average day demand, respectively.

6 Schedule 10 sets forth the average day, maximum day and peak hour system
7 demands in million gallons per day ("mgd") and the ratio of each to the average day.
8 Also shown on Schedule 10 is the fire demand, which has been established at 8,000
9 gallons per minute ("gpm"). The 8,000 gpm fire demand equates to a rate of flow of
10 11.52 million gallons per day (mgd). The fire demand is based on a review of hydrant
11 flow tests, guidelines established by the Insurance Service Organization (and its
12 predecessor, the National Board of Fire Underwriters), the fire demand used in the
13 Company's last rate case, and judgment as to the size and characteristics of the service
14 area.

15
16 **Q. Would you please explain Schedule 2?**

17 A. Schedule 2 summarizes the allocation of the various revenue requirement components to
18 functional classifications and is supported by Schedules 3 through 9. The numerical
19 "code" next to each revenue requirement component refers to the explanations for the
20 allocations, which are found on Schedule 9, pages 1 through 7. Schedule 9, page 1,
21 provides a summary listing of each allocation code and percentage. Pages 2 through 7 of
22 that same schedule provide explanations and, where warranted, calculations of the code.

1 Schedule 3 sets forth the allocation of the pro forma rate base, by component. The
2 results were used to allocate utility operating income and income taxes on Schedule 2.

3 Schedule 4 sets forth the allocation of utility plant, the result of which was carried
4 forward to Schedule 3, and was also used to allocate intangible assets. The utility plant
5 allocation was also used to allocate property taxes and amortization of investment tax
6 credits on Schedule 2.

7 Schedule 5 contains the allocation for accumulated depreciation, and the results
8 carried forward to Schedule 3.

9 Schedule 6 contains the allocation of materials and supplies, and the results are
10 carried forward to Schedule 3.

11 Schedule 7 consists of two pages containing the allocation of pro forma operation
12 and maintenance expenses, the results of which were carried forward to Schedule 2 and
13 were also used to allocate cash working capital on Schedule 3.

14 Schedule 8 contains the allocation for pro forma annual depreciation expense, and
15 the results carried forward to Schedule 2, and were also used to allocate deferred taxes on
16 that schedule.

17
18 **Q. Would you describe Schedule 11, which summarizes the customer class allocation**
19 **factors?**

20 **A.** Yes. Schedule 11 consists of two pages. Page 1 sets forth estimated non-coincidental
21 water demands (as explained below) by customer classes. Customer demands were
22 determined by using typical customer demand ratios and by taking into consideration the

1 volume of water used by each customer class, the overall system demands, other
2 consumption and demand data, Artesian's previous cost of service studies and results of
3 other studies, and judgment.

4 Also included on Page 1 of Schedule 11 are the average day, maximum day, peak
5 hour, and fire demands used to allocate costs to fire service. The average day demand for
6 fire service is estimated at 1% of total system average day. The maximum day fire
7 demand is based on a coincidental fire demand of 8,000 gpm for 4 hours duration, which
8 equals 1.92 mgd. The peak hour fire demand is the 8,000 gpm or a rate of 11.52 mgd.

9 The demands shown on Page 1 of Schedule 11 are non-coincidental, meaning the
10 maximum day and peak hour demands that could be anticipated without diversity of
11 demand among customer classes.

12 Page 2 of Schedule 11 reflects calculations necessary to adjust the allocation
13 percentages among customer classes in order to account for the special characteristics of
14 the Wholesale customers. Unlike the Residential and All Other classes, there are no
15 distribution facilities and related costs allocated to the Wholesale customers.
16 Specifically, only 46.23% of the base costs, 57.14% of the Maximum Day costs and
17 6.57% of the Peak Hour costs are necessary to serve the Wholesale customers. In order to
18 recognize that CCH should not pay a disproportionate amount of the costs related to the
19 distribution system, the allocation of mains to CCH was reduced by excluding
20 approximately 25% of the cost of mains (an estimate of the relative cost of mains 6" in
21 diameter and smaller). Thus, only 87.00% of the base costs, 89.00% of the Maximum
22 Day costs and 77.00% of the Peak Hour costs were allocated to CCH. Accordingly, the

percentage share of Base, Maximum Day and Peak Hour for the various customer classes, as shown on Page 1 of Schedule 11, were adjusted on Page 2 in order to reflect the reduced percentages applicable to the Wholesale customers. Work papers will be made available that provide the calculation of these percentages. As adjusted, the allocation percentages for each customer class shown on Schedule 11 are used to allocate the dollar amount of functionalized costs from Schedule 2 (Base, Maximum Day, Peak Hour, Customer-Meter/Service and Customer-Commercial) to the customer classes, as reflected on Schedule 1.

Q. Having allocated the revenue requirements to customer classes, how did you then calculate the proposed rates needed to yield the allocated costs?

A. With respect to general metered rates, the first step was to establish the "Customer" charges, by meter size, as shown in the top half of Schedule 13.

The customer charges are designed to recover the costs allocated to each "Customer" function. The charge for a 5/8-inch meter is calculated by dividing the number of equivalent 5/8-inch meters served (Schedule 12, page 2) into the total cost allocation to the "Meters and Services and Billing and Accounting" function. The customer charges for other meter sizes are based on their existing relationship to the charge for a 5/8-inch meter, in order to maintain the customer charge structure established by the Delaware Public service Commission. The number of bills and Equivalent Residential Connections ("ERC") are shown on two pages of Schedule 12, by meter size

1 and by customer class; page 1 reflects meter cost ratios and page 2 reflects the ratios
2 under the existing rate structure.
3

4 **Q. How did you calculate the proposed metered rates for each customer class?**

5 A. The calculated customer charge revenues to be generated from each customer class were
6 subtracted from the total costs allocated to each customer class, and the remainder was
7 divided by the respective consumption within the usage rate blocks for each class, as
8 shown in the bottom half of Schedule 13, maintaining the existing relationship of the rate
9 blocks within each class. Wholesale "Rate 1" (Middletown) and Wholesale "Rate 2"
10 (DCC) produce revenues according to the cost allocations. The contract provisions with
11 respect to "Rate 3" (New Castle), "Rate 4" (AWMD), "Rate 5" (Chesapeake) and "Rate
12 6" (Clayton) reflect rates established by contract and for which there will be no increases.
13

14 **Q. How did you calculate fire service rates?**

15 A. The revenue derived from public fire service rates includes the cost of public fire hydrants
16 plus the capacity cost for the potential fire flows that can be met by the water system
17 through the public fire hydrants. Similarly, the revenue derived from private fire service
18 includes the cost of service connections maintained by the Company plus the capacity
19 costs to meet fire service demands for those connections. The capacity costs represent an
20 element of cost that is common to both public and private fire flow requirements.

1 Schedule 14 shows the allocation of capacity costs between private and public fire
2 service. This schedule also summarizes the public fire service costs (capacity and
3 hydrants) and the private fire service costs (capacity, meter/services and billing).

4 Hydrant costs include all revenues required by the Company to support the
5 operating expenses and return on investment in connection with the fire hydrants it owns,
6 operates and maintains.

7 The capacity costs include the portion of the total operating expenses and return
8 on investment in connection with the supply, distribution, and other portions of the
9 system (exclusive of hydrants) owned, operated and maintained by the Company,
10 assignable to fire service, as taken from Schedule 1. Because fire flows are related to
11 both public fire hydrants and private fire service connections, the capacity portion of the
12 fire service revenue requirement has been allocated to public fire service and to private
13 fire service based on consideration of the magnitude of the potential demands for each
14 class of fire service.

15 The design of private fire service rates is set forth on Schedule 15. The billing
16 costs are allocated to each size connection according to the number of bills. The cost of
17 meters and services are allocated to each size connection according to the existing
18 relationship of rates. The capacity costs are allocated according to carrying capacity
19 ratios for each size connection. The sum of all three components equals the rate, by size
20 connection.

21 The designed rates, by meter size, for public fire service are derived by
22 maintaining the existing relationship of rates among meter sizes for customers served by

1 public fire hydrants, as shown on Schedule 16. There are 78,577 customers that are billed
2 for public fire service.
3

4 **Q. Have you prepared schedules showing a comparison of present and designed rates**
5 **and revenues?**

6 A. Yes. Schedule 17 shows a comparison of present and designed rates and revenues for
7 general metered customers, before conversion from quarterly to monthly billing for all
8 customers. Schedule 18 shows a comparison of present and designed rates and revenues
9 for public and private fire protection service.
10

11 **Q. Am I correct that the comparisons of rates and revenues under present and**
12 **designed rates are calculated on the basis of a billing analysis for the pro forma test**
13 **year?**

14 A. Yes. The billing analysis under proposed rates is set forth in Schedule 19 and the billing
15 analysis under present rates is set forth in Schedule 20. Schedule 21 compares the present
16 and proposed rates, and shows the change in the residential rate blocks in order to
17 accommodate the conversion to monthly billing for all customers.
18

19 **Q. Are the variations in the percentage increases for the various customer classes**
20 **reasonable, in your opinion?**

21 A. Yes. The Company's rate filing reflects an overall 15.91% increase in water sales
22 revenues. As shown on Schedule 21, a comparison of present and proposed rates, while

1 the percentage increases differ among the various rates, such differences are inevitable
2 when the goal is to establish cost based rates. The percentage rate increases to Customer
3 Charges are below the overall rate increase and the percentage increases in usage rates are
4 higher than the overall increase. The percentage increases in Public Fire service rates are
5 slightly above the overall rate increase and the percentage increases to the Private Fire
6 service rates are below the overall rate increase. I believe the cost of service study has
7 accomplished the goal of establishing the cost of serving each class of customer and
8 designing rates to recover those costs, without a disproportionate increase to any
9 individual class of customer. It also has maintained a rate structure that encourages water
10 conservation; and as it turned out the increase to the usage rates produces a greater price
11 signal for conservation.

12
13 **Q. Does that conclude your testimony at this time?**

14 **A. Yes.**
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